No. 8000047

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

FFR Cooperative

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF *eighteen* YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

ALFALFA

'Hi-phy'

PLANT VARIETY PROTECTION OFFICE · U.S. DEPARTMENT OF AGRICULTURE

In Testimony Whereof, *I have hereunto set my hand and caused the seal of the* Plant Variety Protection Office *to be affixed at the City of* Washington *this* 24th *day of* September *in the year of our Lord one thousand nine hundred and* eighty-one.

Attest:

Commissioner
Plant Variety Protection Office
Grain Division
Agricultural Marketing Service

Secretary of Agriculture

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
LIVESTOCK, POULTRY, GRAIN & SEED DIVISION

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

INSTRUCTIONS: *See Reverse.*

FORM APPROVED
OMB NO. 40-R3822

No certificate for plant variety protection may be issued unless a completed application form has been received (5 U.S.C. 553).

1a. TEMPORARY DESIGNATION OF VARIETY	1b. VARIETY NAME	FOR OFFICIAL USE ONLY
Syn DH	Hi-phy	PV NUMBER 8000047
2. KIND NAME: Alfalfa	3. GENUS AND SPECIES NAME: *Medicago sativa L.*	FILING DATE 1/25/80 — TIME 3:00 A.M. P.M.
4. FAMILY NAME (BOTANICAL): Leguminosae	5. DATE OF DETERMINATION: November, 1976	FEE RECEIVED $ 500.00 $ 250.00 — DATE 1/25/80 9/8/81
6. NAME OF APPLICANT(S): FFR COOPERATIVE	7. ADDRESS *(Street and No. or R.F.D. No., City, State, and ZIP Code)*: 4112 East State Road 225 West Lafayette, IN 47906	8. TELEPHONE AREA CODE AND NUMBER: 317/567-2115

9. IF THE NAMED APPLICANT IS NOT A PERSON, FORM OF ORGANIZATION: *(Corporation, partnership, association, etc.)*	10. IF INCORPORATED, GIVE STATE AND DATE OF INCORPORATION	11. DATE OF INCORPORATION
Corporation	Wisconsin	March 11, 1960

12. NAME AND MAILING ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS:
Steve J. Baluch, Ph.D.
Forage Research Director
FFR COOPERATIVE, 4112 East State Road 225, West Lafayette, IN 47906

13. **CHECK BOX BELOW FOR EACH ATTACHMENT SUBMITTED:**

- [X] 13A. Exhibit A, Origin and Breeding History of the Variety *(See Section 52 of the Plant Variety Protection Act.)*
- [X] 13B. Exhibit B, Novelty Statement.
- [X] 13C. Exhibit C, Objective Description of the Variety *(Request form from Plant Variety Protection Office.)*
- [ ] 13D. Exhibit D, Additional Description of the Variety.

14a. DOES THE APPLICANT(S) SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED? *(See Section 83(a). (If "Yes," answer 14B and 14C below.)* [ ] YES [X] NO

14b. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?	14c. IF "YES," TO 14B, HOW MANY GENERATIONS OF PRODUCTION BEYOND BREEDER SEED?
[X] YES [ ] NO	[X] FOUNDATION [ ] REGISTERED [X] CERTIFIED

15a. DID THE APPLICANT(S) FILE FOR PROTECTION OF THIS VARIETY IN OTHER COUNTRIES? [ ] YES [X] NO *(If "Yes," give name of countries and dates.)*

15b. HAVE RIGHTS BEEN GRANTED THIS VARIETY IN OTHER COUNTRIES? [ ] YES [X] NO *(If "Yes," give name of countries and dates.)*

16. DOES THE APPLICANT(S) AGREE TO THE PUBLICATION OF HIS/HER (THEIR) NAME(S) AND ADDRESS IN THE OFFICIAL JOURNAL? [X] YES [ ] NO

17. The applicant(s) declare(s) that a viable sample of basic seed of this variety will be furnished with the application and will be replenished upon request in accordance with such regulations as may be applicable.

The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) that the variety is distinct, uniform, and stable as required in Section 41, and is entitled to protection under the provisions of Section 42 of the Plant Variety Act.

Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.

1-21-80
(DATE)

Steve J. Baluch
(SIGNATURE OF APPLICANT)

1

(DATE)

(SIGNATURE OF APPLICANT)

FORM GR-470 (1-78)

INSTRUCTIONS

GENERAL: Send an original copy of the application and exhibits, at least 2,500 viable seeds, and $500 fee ($250 filing fee and $250 examination fee) to U.S. Dept. of Agriculture, Agricultural Marketing Service, Livestock, Poultry, Grain and Seed Division, Plant Variety Protection Office, National Agricultural Library Building, Beltsville, Maryland 20705. (See section 180.175 of the Regulations and Rules of Practice.) Retain one copy for your files. All items on the face of the form are self-explanatory unless noted below.

ITEM

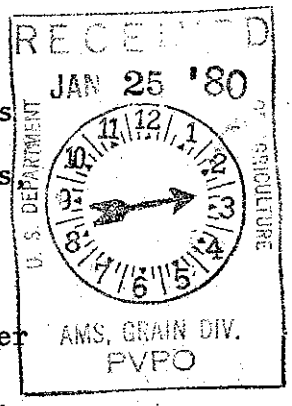
5 Give the date the applicant determined that he had a new variety based on (1) the definition in section 41(a) of the Act and (2) the date a decision was made to increase the seed.

13a Give: (1) the genealogy, including public and commercial varieties, lines, or clones used, and the breeding method; (2) the details of subsequent stages of selection and multiplication; (3) the type and frequency of variants during reproduction and multiplication and state how these variants may be identified and (4) evidence of uniformity and stability.

13b Give a summary statement of the variety's novelty. Clearly state how this novel variety may be distinguished from all other varieties in the same crop. If the new variety most closely resembles one or a group of related varieties: (1) identify these varieties and state all differences objectively; (2) attach statistical data for characters expressed numerically and demonstrate that these differences are significant; and (3) submit, if helpful, seed and plant specimens or photographs of seed and plant comparisons clearly indicating novelty.

13c Fill in the Exhibit C, Objective Description form, for all characteristics for which you have adequate data.

13d Describe any additional characteristics that are not described, or whose description cannot be accurately conveyed in Exhibit C. Use comparative varieties as is necessary to reveal more accurately the description of characteristics that are difficult to describe, such as plant habit, plant color, disease resistance, etc.



14a If "YES" is specified (seed of this variety be sold by variety name only as a class of certified seed) the applicant may NOT reverse his affirmative decision after the variety has either been sold and so labeled, his decision published, or the certificate has been issued. However, if the applicant specified "NO," he may change his choice. (See section 180.16 of the Regulations and Rules of Practice.)

15a See section 42 of the Plant Variety Protection Act and section 180.7 of the Regulations and Rules of Practice.

EXHIBIT A

Origin and Breeding History

Hi-phy is a nine-clone synthetic variety with parents derived from a recurrent selection program that traces on the maternal side to the cultivars Weevlchek and Tempo. Six of the parent clones trace to the cultivar Weevlchek and three to Tempo. Parent clones were among plants selected on the bases of vigor, phytophthora root rot resistance and bacterial wilt resistance.

AMENDMENT TO EXHIBIT A - UNIFORMITY + STABILITY

FFR COOPERATIVE
4112 E. State Road 225
W. Lafayette, IN 47906
317-567-2115

August 12, 1980

Mr. Douglas C. Bailey
Plant Variety Protection Office
USDA, Agri-Marketing Service
Beltsville, MD 20705

Dear Mr. Bailey:

I have enclosed two copies of supplementary data to be used for Classic and Hi-phy. Both copies are identical with both varieties included in each.

As for type and frequency of variants in either variety, seed certification people and FFR staff have not observed any variability in foundation and/or certified fields in California.

Both Classic and Hi-phy meet presently accepted, commercial standards of uniformity and stability for alfalfa. The California seed certification inspectors are very pleased with both Classic and Hi-phy in inspected fields. We at FFR have tested all three classes of seed in the east and have not seen any breakdown of uniformity or stability.

Sincerely,

FFR COOPERATIVE

Steve J. Baluch, Ph.D.
Forage Research Director

SJB/mm

Enclosures

3

AMENDMENT TO EXHIBIT B

Novelty Statement

Hi-phy most closely resembles Tempo in plant type, spring vigor, growth habit and area of adaptation. It is distinguishable from Tempo by the following characteristics:

1. Bacterial wilt--The variety Hi-phy has 64% of its population resistant to bacterial wilt, whereas Tempo is 26% resistant. This is a 38% difference (Table 2, page 5, 1980 edition of "Varietal Trials of Farm Crops," Minnesota, Miscellaneous Report No. 24).

2. Phytophthora root rot--The variety Hi-phy has 26% of its population resistant to Phytophthora root rot, whereas Tempo is 2% resistant. This is a 24% difference (Table 2, page 5, 1980 edition of "Varietal Trials of Farm Crops," Minnesota, Miscellaneous Report No. 24).

3. Anthracnose--The variety Hi-phy has been shown to be susceptible to Anthracnose in a greenhouse test at FFR Cooperative (table 1A).

TABLE 1A

Anthracnose Disease Ratings[1/]

Cultivar	% Res.	ASI	% Survivors
Classic	9.0	4.62	14.6
Hi-phy	1.3	4.92	4.0
Weevlchek	2.6	4.89	4.6
Tempo	2.3	4.87	5.5
Saranac AR	43.5	3.26	60.5
Arc	38.5	3.12	60.5
Vangard	36.9	3.29	60.2

1/ FFR Cooperative laboratory test (summary of two tests, total of 1,000 plants per cultivar screened).

Table 2. Winterhardiness index and disease resistance of alfalfa varieties eligible for certification

MINNESOTA MISC. REPORT #24, 1980 EDITION

Variety	Developer or owner[1]	Winterhardiness (Index)[2]	RESISTANT PLANTS[3] Bacterial wilt (percent)	Phytophthora root ro (percent)
VERY WINTERHARDY		highest value best		
Norseman	Barzen of Minneapolis[a]	7.9	30	4
Ladak	USDA (foreign introduction)[chr]	7.5	8	2
Travois	S. Dakota Agr. Exp. Sta.[cr]	7.4	37	1
Ramsey	Minnesota Agr. Exp. Sta. & USDA[m]	6.7	37	9
WINTERHARDY				
Baker	Nebraska Agr. Exp. Sta. & USDA[cirt]	6.5	50	3
Vernal	Wisconsin Agr. Exp. Sta. & USDA[cehijkmoqrstu]	6.5	42	2
Titan	Rudy Patrick Co.[f]	6.4	60	2
Conquest	Pioneer Hi-Bred International Inc.[m]	6.3	21	4
123	DeKalb Ag Research Inc.[d]	6.3	41	3
WL 215	Waterman-Loomis Co.[ci]	6.3	36	4
Agate	Minnesota Agr. Exp. Sta. & USDA[chijkmoqrstu]	6.0	65	43
Iroquois	Cornell University[cijostu]	6.0	61	1
Ladak 65	Montana Agr. Exp. Sta.[a]	6.0	36	2
Nugget	P-A-G[1]	5.9	46	<1
520	Pioneer Hi-Bred International Inc.[n]	5.9	40	1
521	Pioneer Hi-Bred International Inc.[n]	5.9	19	1
524	Pioneer Hi-Bred International Inc.[n]	5.9	24	1
Blazer	Land O'Lakes[i]	5.9	53	19
545	Pioneer Hi-Bred International Inc.[n]	5.8	35	25
SX-10	Sexauer Co.[r]	5.7	5	3
Phytor	Northrup King & Co.[k]	5.5	34	24
Valor	Land O'Lakes[1]	5.5	36	2
Weevichek	Farmers Forage Res. Coop.[c]	5.5	57	2
120	DeKalb Ag. Research Inc.[d]	5.5	57	39
Anchor	Rudy Patrick Co.[f]	5.4	36	3
Gladiator	Northrup King Co.[k]	5.4	57	1
Polar 1	Pride Seed Co.[p]	5.4	49	8
Ranger	Nebraska Agr. Exp. Sta. & USDA[cehijmoru]	5.4	18	2
WL 220	Waterman-Loomis Co.[j]	5.4	49	12
MODERATELY WINTERHARDY				
Pacer	Land O'Lakes[i]	5.3	33	8
Citation	North American Plant Breeders[j]	5.2	45	2
Marathon	Cargill[b]	5.2	36	2
Apollo	North American Plant Breeders[f]	5.1	36	40
Tempo	Farmers Forage Res. Coop.[c]	5.1	26	2
A59	E.F. Mangelsdorf & Bros. Inc.[q]	5.0	16	4
Classic	Farmers Forage Res. Coop.[c]	5.0	39	7
530	Pioneer Hi-Bred International Inc.[n]	5.0	38	2
WL 309	Waterman-Loomis Co.[cju]	4.7	25	3
WL 311	Waterman-Loomis Co.[c]	4.7	36	2
Answer	Midland Cooperatives, Inc.[j]	4.6	50	66
Honeoye	Cornell University[s]	4.6	16	<1
Primal	Pride Seed Co.[p]	4.6	62	9
Saranac AR	Cornell University	4.6	29	8
WL 318	Waterman-Loomis Co.[cju]	4.6	32	20
G777	Funk Seed Int.[g]	4.5	25	4
Saranac	Cornell University[imo]	4.5	49	2
Thor	Northrup King & Co.[r]	4.5	69	1
Trident	P-A-G[1]	4.5	37	71
SX-418	The Sexauer Co.[r]	4.5	33	—
A-57	Embro Seed Co. Inc.[q]	4.4	12	6
Warrior	Northrup King & Co.[k]	4.3	20	<1
131	Cal/West Seeds[d]	4.3	10	1
531	Pioneer Hi-Bred International Inc.[n]	4.3	23	3
Olympic	North American Plant Breeders[e]	4.2	39	3
WL 219	Waterman-Loomis Co.[c]	4.2	27	9
Hi-Phy	Farmers Forage Res. Coop.[c]	4.1	64	26

[1]1980 seed suppliers: a. Barzen of Minneapolis, b. Cargill Seeds, c. Cenex, d. DeKalb, e. Farmland Industries, f. Field Seed Farms, g. Funk Seeds International, Inc., h. Interstate Seed and Grain Co., i. Land O'Lakes, Inc., j. Midland Cooperatives, Inc. k. Northrup King Co., l. P-A-G Seeds, m. Peterson Forage Seed Div., n. Pioneer Hi-Bred International, Inc., o. Premium Seed Co., p. Pride Co., Inc., q. Ramy Seed Co., r. The Sexauer Co., s. Twin City Seed Co., t. Werner Farm Seeds, Inc., u. Peterson-Biddick Co. [2]Based on fall growth after cutting 1st week of September: 1 = tallest (least winterhardy), 9 = shortest. [3]Plants with little or no injury are classified as resistant.

TABLE 13

Leafhopper Rating

(1 = Most Resistant; 9 = Least Resistant)

Variety	Nursery[1/] 1 7-15-76	2 7-9-74	3 7-9-75	3 8-5-76	4 7-2-75	5 7-2-75	5 8-20-75	6 7-8-76
Classic	3.3	4.5	3.8	3.5	2.3	-	-	2.3
Hi-phy	-	-	4.5	3.0	-	4.5	4.5	2.0
Weevlchek	2.8	4.5	4.5	3.8	5.0	4.0	4.0	2.3
Tempo	4.5	6.0	5.0	3.5	5.0	4.5	4.5	2.8
Team	4.8	6.8	4.5	3.0	4.0	5.3	4.0	1.8
Vernal	5.0	6.8	4.0	4.5	6.0	5.5	3.3	-
Agate	-	-	5.0	3.8	5.8	6.7	4.0	2.3
LSD.05	1.9	2.0	3.5	1.2	1.9	2.0	1.7	.9

[1/] FFR Nursery Identification See Table #1

TABLE 15

Alfalfa Weevil Rating

(1 = Least Feeding Damage; 9 = Most Feeding Damage)

Variety	Nursery [1]/ 1 5-13-74	4 5-11-76	5 5-11-76
Classic	3.8	4.3	-
Hi-phy	-	-	7.0
Weevlchek	4.5	6.8	7.3
Tempo	6.0	9.0	7.0
Team	3.0	2.3	2.8
Vernal	3.8	7.5	8.5
Agate	-	9.0	7.3
LSD.05	3.6	2.5	3.7

[1]/ FFR Nursery Identification See Table #1

TABLE 20

Phytophthora Yield Trial
East Lansing, Michigan
Michigan State University

Rank Order	Variety	1976 Total Yield[1/]	1977 Total Yield[2/]	Two Year Average
2	Iroquois	2.81	5.23	3.85
1	Hi-phy	2.71	5.41	3.90
5	Vernal	2.51	4.46	3.34
3	Apollo	2.48	5.00	3.59
4	Saranac	2.41	4.83	3.47
6	Agate	2.35	4.45	3.26
7	LSD.05	.63	.67	.44
8	CV	17.2	10.4	-

1/ Two harvests at 12% moisture per acre.

2/ Four harvests at 12% moisture per acre.

TABLE 21

FFR Greenhouse Phytophthora Test

(1 = Most Resistant; 5 = Least Resistant)

	Test Year		
Variety	1974	1975	1976
Hi-phy	3.34	3.52	3.87
Agate	3.22	3.36	3.83
Lahanton	4.06	-	-
Dupuits	4.57	-	-
Tempo	-	3.76	4.47
Weevlchek	-	3.86	4.34
Vernal	-	4.04	4.28
Team	-	4.10	-
Apollo	-	-	3.64
LSD.05	-	.66	.64

TABLE I

FFR Nursery Identification

Nursery Number				
1	4 rep	Planted Spring 1973	in	Elizabethtown, N.J.
2	4 rep	Planted Spring 1973	in	Lafayette, IN
3	4 rep	Planted Spring 1974	in	Lafayette, IN
4	4 rep	Planted Spring 1974	in	Warsaw, VA
5	4 rep	Planted Fall 1974	in	Warsaw, VA
6	4 rep	Planted Fall 1975	in	Marshall, MO
7	4 rep	Planted Spring 1976	in	Cozad, NE
8	4 rep	Planted Spring 1977	in	Lafayette, IN

AMENDMENT TO EXHIBIT C

Objective Description of Variety

Anthracnose

In an FFR greenhouse test Hi-phy was shown to be susceptible to Anthracnose (table 1A)

Spotted Alfalfa Aphid

Under seed production conditions in Fresno County, California, Hi-phy was judged to be tolerant (ability of plants to endure SAA). A copy of the report is enclosed.

TABLE 9

Spring Vigor Rating

(1 = Most Vigorous; 9 = Least Vigorous)

Variety	Nursery [1]/ 1 3-26-74	2 4-27-75	3 4-27-75	4 3-3-76	5 3-3-76	6 3-29-77
Classic	1.0	1.7	2.2	4.8	-	3.2
Hi-phy	-	-	2.5	-	3.5	1.7
Weevlchek	2.8	3.0	3.3	4.8	6.0	4.3
Tempo	3.3	2.5	2.0	3.0	2.5	2.0
Team	2.3	3.0	3.0	4.3	4.5	2.3
Vernal	4.5	3.0	3.3	6.5	5.5	-
Agate	-	-	2.5	5.5	5.5	2.8
LSD.05	1.5	1.7	.8	1.4	1.8	1.0

[1]/ FFR Nursery Identification See Table #1

TABLE 11

Fall Vigor Rating

(1 = Most Vigorous; 9 = Least Vigorous)

Variety	Nursery 1/ 2 10-28-74	8 10-5-77
Classic	5.0	5.0
Hi-phy	-	3.8
Weevlchek	5.3	5.3
Tempo	4.5	4.0
Team	4.8	-
Vernal	7.5	6.8
Agate	-	5.3
LSD.05	1.7	2.0

1/ FFR Nursery Identification See Table #1

TABLE 16

Leaf Color Rating

(1 = Dark Green; 9 = Light Green)

Variety	Nursery [1]/ 2 4-16-74	4 9-9-75	5 9-9-75
Classic	2.5	2.5	-
Hi-phy	-	-	3.5
Weevlchek	1.5	4.0	4.5
Tempo	2.8	5.5	6.0
Team	5.3	5.0	4.3
Vernal	4.5	6.5	5.5
Agate	-	5.5	6.0
LSD.05	2.4	.7	2.1

[1]/ FFR Nursery Identification See Table #1